

### Trend Study 28-3-03

Study site name: Bear Valley.

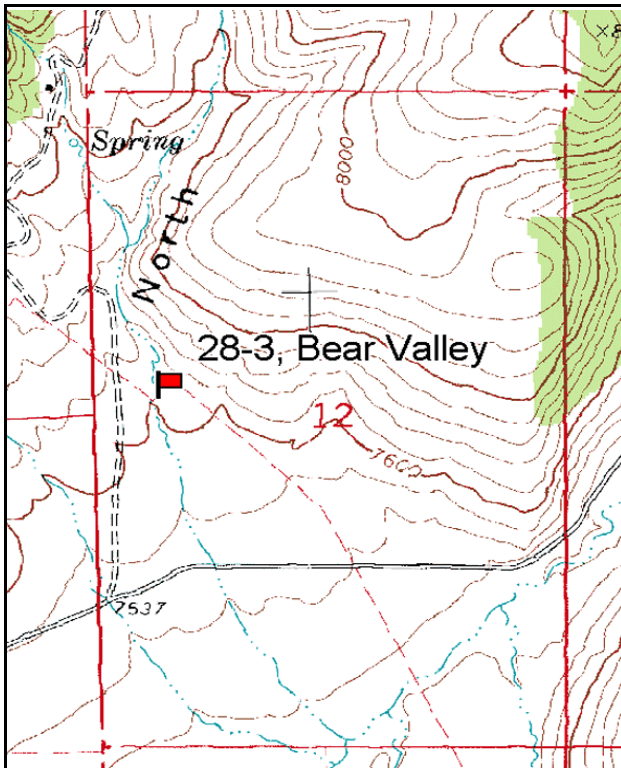
Vegetation type: Chained Shrubland.

Compass bearing: frequency baseline 77 degrees magnetic. (Lines 2-4 130°M).

Frequency belt placement: line 1 (11 & 71ft), line 2 (59ft), line 3 (34ft), line 4 (95ft).

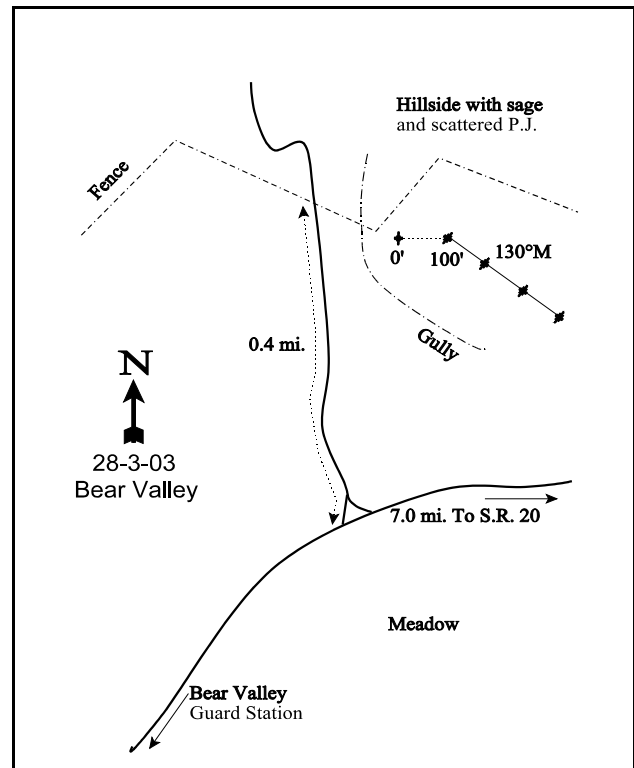
#### LOCATION DESCRIPTION

From the US 89-SR 20 Junction, go approximately 7.0 miles west on SR 20 to a corral past mile marker 14. Turn left on the Little Creek Road that leads to Bear Valley. Travel 7.0 miles south on the main road to a minor fork. Turn right and go 0.4 miles to a fence and wire gate. Stop here and walk east along the fenceline to the corner. Walk 4 paces east from the fence corner to a short red fencepost tagged #7163 which is the 0-foot baseline stake. The 100-foot stake is rebar.



Map name: Little Creek Peak

Township 33S, Range 6 1/2W, Section 5



Diagrammatic Sketch

GPS: NAD 27, UTM 12S 4201913 N, 360559 E

## DISCUSSION

### Bear Valley - Trend Study No. 28-3

This study samples a seeded range in the bottom of a large valley at the north end of Upper Bear Valley. The site slopes gently (3-5%) to the southeast at an elevation of 7,600 feet. The area is at the upper limits of normal deer winter range and is also used by elk. Several cabins can be found a few miles from the transect. Pellet group transect data collected on site in 1998 estimated 3 elk, 19 deer, and 65 cow days use/acre (7 ddu/ha, 47 edu/ha, and 161 cdu/ha). Deer use remained low in 2003 at an estimated 11 days use/acre (28 ddu/ha) while cattle declined to only 22 days use/acre (56 cdu/ha). Cattle pats sampled in 2003 were from the previous grazing season. Rabbit pellets were very abundant on the site in 2003 as they were sampled in 82% of the sampling quadrats.

Soil analysis indicates a sandy loam texture with a moderately acidic pH (5.8). The soil is fairly deep with an average effective rooting depth of more than 17 inches. Vegetative cover provided primarily by perennial grasses is good, but scattered bare areas show evidence of slight erosion. An erosion condition class assessment rated soils to be stable in 2003, although pedestalling around bunchgrasses was moderately high and there was evidence of erosion in a nearby gully. Bare ground has been moderate to high in all readings, peaking at 43% in 2003.

Browse is not a prominent forage component on this seeding. Mountain big sagebrush increased in density between 1992 and 1998 due to the abundance of young plants in the population (1,200 plants/acre) in 1998. With drought prior to and including 2003, the number of young declined to only 20 plants/acre, and overall sagebrush density declined from 1,540 plants/acre in 1998 to 940 in 2003. Use varies from light to heavy depending on individual plants. No decadent plants were sampled during the first 3 readings, but 40% of the population was decadent in 2003. Annual sagebrush leaders had averaged 1.2 inches of growth when the site was read in late June of 2003. Big sagebrush is much more abundant on the slopes that surround this seeded valley bottom. Stickyleaf low rabbitbrush is the most abundant browse on the site. Density was estimated at 10,666 plants/acre in 1987, 17,080 plants/acre in 1992, and 11,320 plants/acre in 1998. The young age class was very abundant during all 3 of these readings ranging from 38-61% of the population. In 2003, density declined to 6,580 plants/acre due mostly to the decline in the number of young. Rabbitbrush plants are vigorous and most show light use. Other shrubs sampled on the site in low densities include rubber rabbitbrush, gray horsebrush, and broom snakeweed.

As mentioned above, mountain big sagebrush is abundant on the slopes that surround the valley bottom, although the transect samples the valley bottom which is dominated by seeded grasses, primarily crested wheatgrass. Crested wheatgrass has maintained a nearly stable frequency over the years and has been sampled in 98-100% of the quadrats in all readings. Crested wheatgrass has provided at least 90% of the total grass cover on the site since 1992. Western wheatgrass is second in abundance to crested wheatgrass. The wheatgrasses were noted as being large and vigorous with light to moderate utilization in 1998. Blue grama and a sedge are scattered throughout the site and both show a significant decline in nested frequency since 1987. Forbs were diverse and moderately abundant from 1987-1998. In 2003 with drought conditions, perennial forbs declined in sum of nested frequency by nearly 90%, and annual forbs declined by nearly 98%. Although forbs are less important as winter forage, lupine, yellow salsify, groundsel, and dandelion provide desirable spring and summer feed. Of these, only lupine was sampled in 2003 although it significantly declined in nested frequency.

### 1987 APPARENT TREND ASSESSMENT

Ground cover is good in this seeding even though bare soil was estimated at 18%. Rocks and/or pavement cover an additional 17% of the ground surface. The bunchgrasses and associated litter provide good ground cover, but there is apparently room for increase. Browse on the site is dominated by low rabbitbrush which appears to be increasing.

### 1992 TREND ASSESSMENT

The site had recently been grazed, so bare ground estimates were higher than in 1987 at 37%. Litter cover has also greatly declined with extended drought. No erosion was evident, although some soil pedestalling was noted. Trend for soil is slightly down. The browse trend is slightly down due to the low densities for mountain big sagebrush and rubber rabbitbrush. The less desirable low rabbitbrush has increased to 17,080 plants/acre and maintains a dynamic reproductive potential. Trend for herbaceous understory is stable. Nested frequencies of perennial grasses and forbs showed little change.

#### TREND ASSESSMENT

soil - slightly down (2)

browse - slightly down (2)

herbaceous understory - stable (3)

### 1998 TREND ASSESSMENT

The soil trend is slightly upward with an increase in percent vegetation and litter cover. Erosion potential is still present, but is greatly reduced due to the levelness of the site. Bare ground also declined in 1998. The browse trend is stable. The mountain big sagebrush density has increased since 1992, but this is a mostly young population that still needs to become established. The population exhibits good biotic potential, no decadency, and light utilization. The low rabbitbrush population density is fluctuating between years most likely due to precipitation patterns. The herbaceous understory trend is stable as the total perennial herbaceous understory sum of nested frequency has increased since 1992. Perennial grass sum of nested frequency has declined slightly, while perennial forb sum of nested frequency has increased since 1992.

#### TREND ASSESSMENT

soil - slightly upward (4)

browse - stable (3)

herbaceous understory - stable (3)

### 2003 TREND ASSESSMENT

Trend for soil is down. Bare ground increased while vegetation and litter cover both decreased. Nested frequency of perennial grasses and forbs declined with drought conditions as well. These negative changes translate into increased erosion potential due to less protective cover on the soil surface. Trend for browse is down. The mountain big sagebrush population declined in density, and percent decadence increased to 40%. Recruitment into the population by young plants was very high in 1998 at 78%, but declined to only 2% in 2003. Trend for the herbaceous understory is slightly down overall. Crested wheatgrass dominates the site with western wheatgrass being of secondary importance. Perennial grasses are stable in nested frequency, and production increased as average cover went from 19% to 27%. Forbs are down with an 88% decline in sum of nested frequency due to drought conditions and competition with crested wheatgrass. Yellow salsify, dandelion, lupine, and groundsel are important species that provide spring and summer forage. Of these, only lupine was sampled in 2003.

# TREND ASSESSMENT

soil - down (1)

browse - down (1)

herbaceous understory - slightly down (2)

## HERBACEOUS TRENDS --

Management unit 28 , Study no: 3

T y p e	Species	Nested Frequency				Average Cover %		
		'87	'92	'98	'03	'92	'98	'03
G	Agropyron cristatum	<sub>b</sub> 320	<sub>a</sub> 297	<sub>ab</sub> 299	<sub>ab</sub> 318	17.26	17.40	25.88
G	Agropyron smithii	41	73	58	42	.31	.45	.34
G	Bouteloua gracilis	<sub>c</sub> 32	<sub>bc</sub> 25	<sub>ab</sub> 7	<sub>a</sub> 3	.43	.21	.15
G	Bromus tectorum (a)	-	<sub>a</sub> -	<sub>b</sub> 18	<sub>b</sub> 38	-	.52	.76
G	Carex spp.	<sub>c</sub> 19	<sub>bc</sub> 10	<sub>a</sub> -	<sub>ab</sub> 3	.02	-	.00
G	Elymus junceus	3	1	2	3	.00	.00	.15
G	Poa pratensis	<sub>a</sub> 5	<sub>a</sub> 2	<sub>b</sub> 12	<sub>a</sub> -	.03	.37	-
G	Stipa comata	<sub>ab</sub> 27	<sub>b</sub> 44	<sub>a</sub> 13	<sub>a</sub> 9	1.10	.37	.26
Total for Annual Grasses		0	0	18	38	0	0.52	0.76
Total for Perennial Grasses		447	452	391	378	19.17	18.82	26.78
Total for Grasses		447	452	409	416	19.17	19.34	27.54
F	Agoseris glauca	-	-	2	2	-	.00	.03
F	Androsace septentrionalis (a)	-	<sub>b</sub> 15	<sub>c</sub> 162	<sub>a</sub> -	.03	2.82	-
F	Arabis spp.	2	-	-	-	-	-	-
F	Artemisia ludoviciana	11	3	11	3	.00	.56	.00
F	Astragalus panguicensis	3	8	2	-	.02	.01	-
F	Castilleja linariaefolia	-	-	-	10	-	-	.18
F	Chaenactis douglasii	3	-	-	-	-	-	-
F	Cirsium spp.	-	8	4	5	.04	.15	.04
F	Collinsia parviflora (a)	-	<sub>a</sub> -	<sub>b</sub> 112	<sub>a</sub> -	-	.91	-
F	Crepis acuminata	-	-	4	-	-	.01	-
F	Descurainia pinnata (a)	-	-	2	1	-	.00	.00
F	Dracocephalum parviflorum	-	-	3	-	-	.01	-
F	Epilobium brachycarpum (a)	-	-	1	-	-	.00	-
F	Eriogonum cernuum (a)	-	4	-	-	.01	-	-
F	Erigeron flagellaris	1	-	-	-	-	-	-
F	Erigeron pumilus	-	-	-	2	-	-	.00
F	Euphorbia spp.	-	-	3	-	-	.03	-
F	Ipomopsis aggregata	-	-	1	-	-	.00	-
F	Lappula occidentalis (a)	-	<sub>a</sub> 12	<sub>b</sub> 116	<sub>a</sub> 12	.03	1.89	.04
F	Lepidium spp. (a)	-	2	-	-	.00	-	-

T y p e	Species	Nested Frequency				Average Cover %		
		'87	'92	'98	'03	'92	'98	'03
F	Lupinus argenteus	c <sup>91</sup>	b <sup>70</sup>	c <sup>109</sup>	a <sup>7</sup>	2.97	1.35	.30
F	Lygodesmia spinosa	a <sup>10</sup>	b <sup>16</sup>	ab <sup>14</sup>	ab <sup>12</sup>	.27	.39	.39
F	Microsteris gracilis (a)	-	a <sup>3</sup>	b <sup>216</sup>	a <sup>3</sup>	.00	2.27	.00
F	Oenothera coronopifolia	-	-	10	-	-	.07	-
F	Oenothera pallida	c <sup>35</sup>	ab <sup>9</sup>	bc <sup>27</sup>	a <sup>-</sup>	.05	.31	-
F	Penstemon spp.	-	-	1	-	-	.00	-
F	Phlox longifolia	b <sup>50</sup>	b <sup>61</sup>	c <sup>140</sup>	a <sup>7</sup>	.15	.86	.16
F	Polygonum douglasii (a)	-	b <sup>31</sup>	c <sup>94</sup>	a <sup>-</sup>	.07	1.00	-
F	Senecio douglasii	b <sup>30</sup>	b <sup>27</sup>	a <sup>-</sup>	a <sup>-</sup>	.54	-	-
F	Senecio multilobatus	-	-	1	-	-	.00	-
F	Sphaeralcea coccinea	-	-	9	-	-	.07	-
F	Taraxacum officinale	b <sup>11</sup>	ab <sup>5</sup>	b <sup>12</sup>	a <sup>-</sup>	.01	.06	-
F	Tragopogon dubius	b <sup>18</sup>	ab <sup>1</sup>	c <sup>55</sup>	a <sup>-</sup>	.00	.62	-
F	Unknown forb-annual (a)	-	-	37	-	-	.12	-
Total for Annual Forbs		0	67	740	16	0.15	9.05	0.04
Total for Perennial Forbs		265	208	408	48	4.06	4.56	1.12
Total for Forbs		265	275	1148	64	4.21	13.61	1.17

Values with different subscript letters are significantly different at alpha = 0.10

#### BROWSE TRENDS --

Management unit 28 , Study no: 3

T y p e	Species	Strip Frequency			Average Cover %		
		'92	'98	'03	'92	'98	'03
B	Artemisia tridentata vaseyana	5	31	19	.13	1.25	2.79
B	Chrysothamnus nauseosus	1	19	0	.15	1.25	-
B	Chrysothamnus viscidiflorus viscidiflorus	99	99	86	4.56	10.96	2.63
B	Gutierrezia sarothrae	0	0	2	-	-	.00
B	Tetradymia canescens	5	6	5	.44	.21	.30
Total for Browse		110	155	112	5.28	13.68	5.73

CANOPY COVER, LINE INTERCEPT --

Management unit 28 , Study no: 3

Species	Percent Cover
	'03
<i>Artemisia tridentata vaseyana</i>	1.31
<i>Chrysothamnus viscidiflorus viscidiflorus</i>	2.08
<i>Tetradymia canescens</i>	.05

KEY BROWSE ANNUAL LEADER GROWTH --

Management unit 28 , Study no: 3

Species	Average leader growth (in)
	'03
<i>Artemisia tridentata vaseyana</i>	1.2

BASIC COVER --

Management unit 28 , Study no: 3

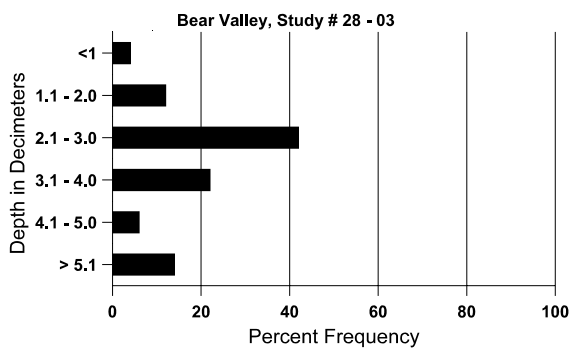
Cover Type	Average Cover %			
	'87	'92	'98	'03
Vegetation	7.00	28.50	45.32	34.58
Rock	4.75	6.33	.26	.27
Pavement	11.50	0	11.18	5.51
Litter	58.50	25.89	48.66	24.17
Cryptogams	0	0	.00	0
Bare Ground	18.25	37.15	28.85	42.65

SOIL ANALYSIS DATA --

Management unit 28, Study no: 3, Study Name: Bear Valley

Effective rooting depth (in)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	ds/m
17.3	62.0 (12.9)	5.8	64.2	20.0	15.8	2.3	19.9	1542.4	0.3

## Stoniness Index



PELLET GROUP DATA --

Management unit 28 , Study no: 3

Type	Quadrat Frequency		
	'92	'98	'03
Rabbit	88	19	82
Elk	-	2	-
Deer	10	23	9
Cattle	3	29	8

Days use per acre (ha)	
'98	'03
-	-
3 (7)	-
19 (47)	11 (28)
65 (161)	23 (56)

BROWSE CHARACTERISTICS --

Management unit 28 , Study no: 3

		Age class distribution (plants per acre)					Utilization				
Y	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% poor vigor	Average Height Crown (in)
<i>Artemisia tridentata</i> vaseyana											
87	<b>933</b>	-	333	600	-	-	36	7	0	7	7/6
92	<b>120</b>	40	20	100	-	-	50	0	0	0	-/-
98	<b>1540</b>	160	1200	340	-	40	9	0	0	21	21/28
03	<b>940</b>	20	20	540	380	60	26	17	40	2	22/27
<i>Chrysothamnus nauseosus</i>											
87	<b>266</b>	-	66	200	-	-	0	0	-	0	20/13
92	<b>20</b>	-	-	20	-	-	100	0	-	100	-/-
98	<b>560</b>	-	100	460	-	-	0	0	-	0	11/17
03	<b>0</b>	-	-	-	-	20	0	0	-	0	24/34
<i>Chrysothamnus viscidiflorus viscidiflorus</i>											
87	<b>10666</b>	133	6466	3600	600	-	.62	0	6	6	17/12
92	<b>17080</b>	480	9060	7500	520	-	12	1	3	.93	-/-
98	<b>11320</b>	160	4260	6860	200	140	3	0	2	2	14/16
03	<b>6580</b>	20	920	4800	860	180	2	11	13	4	9/8
<i>Gutierrezia sarothrae</i>											
87	<b>0</b>	-	-	-	-	-	0	0	-	0	-/-
92	<b>0</b>	-	-	-	-	-	0	0	-	0	-/-
98	<b>0</b>	-	-	-	-	-	0	0	-	0	-/-
03	<b>100</b>	-	-	100	-	-	0	0	-	0	3/4
<i>Symphoricarpos oreophilus</i>											
87	<b>0</b>	-	-	-	-	-	0	0	-	0	-/-
92	<b>0</b>	-	-	-	-	-	0	0	-	0	-/-
98	<b>0</b>	-	-	-	-	-	0	0	-	0	16/14
03	<b>0</b>	-	-	-	-	-	0	0	-	0	37/82

		Age class distribution (plants per acre)					Utilization				
Y e a r	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% poor vigor	Average Height Crown (in)
Tetradymia canescens											
87	<b>0</b>	-	-	-	-	-	0	0	0	0	-/-
92	<b>240</b>	-	80	140	20	-	8	0	8	0	-/-
98	<b>180</b>	-	20	160	-	-	11	0	0	0	14/21
03	<b>200</b>	-	-	140	60	-	10	10	30	0	11/13